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EXAMINER	
KUMAR, PANKAJ	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/068,643	HAMIED ET AL.	
	Examiner	Art Unit	
	Pankaj Kumar	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,3,7,8,14,15,18,20,21 and 24* is/are allowed.

6)☒ Claim(s) *1,4-6,9-13,16,17,19,22 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/20/2005 have been fully considered but they are not persuasive.

2. Applicant argues that the characterization of Kawaguchi teaching vector norm is incorrect since Kawaguchi's voltage at any node in the receiver does not have a receive direction and is not a complex value and hence has no direction. This is not persuasive. Kawaguchi is switching the receive antenna based on the strength of the received signal. The signals arrive at different antennas from different directions and a magnitude of the strength is calculated. Although this calculation can be considered a voltage, this voltage is based on the strength from a particular direction. A vector has direction and a magnitude of a vector is a magnitude of the direction. Also, Kawaguchi teaches complex with I (inphase) and Q (quadrature).

3. As per applicant's argument about vector norm being computed based on measured complex channel coefficients associated with the one or more propagation channels, this is based on a new limitation added to the claims which is analyzed below.

4. Applicant argues that they could not see Morris having channel filter coefficients or removing noise and signal normalizing and thus Morris was mischaracterized. This is not persuasive. Morris has a slicer 230 which is another word for filter. Since 230 is in the digital domain, 230 inherently has coefficients. Since the data is communicated through a channel and 230 is working on such data, 230 has channel filter coefficients. Since a filter is inherently used to remove noise, 230 is making the signal be a normal signal instead of a noisy signal and hence 230 is normalizing the signal.

Response to Amendment

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 4, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boren USPN 5,226,057 in view of Kawaguchi USPN 6,873,835. Here is how the reference teaches the claims:

7. As per claim 1, Boren teaches receiving a binary stream (Boren fig. 1: output of 17 has binary bits) assembled into groups of bits (Boren fig. 1 is designed to operate more than once and hence there will be groups of bits) forming symbol indices (not in Boren but would be obvious as explained below); and generating at least one complex symbol value (Boren fig. 1: I , Q) in response to a reception of the binary stream (Boren fig. 1: output of 17 has binary bits), each complex symbol value of the at least one complex symbol value being normalized over one or more channel coefficients (Boren fig. 1: I , Q are filtered in 25 and 35 with 33 in 31) associated with the one or more propagation channels (Boren the propagation of the signals through the channel(s) in fig. 1).

8. Boren does not teach forming symbol indices as claimed. Boren does teach forming symbol indices later in fig. 1 with x1(n), y1(n), xj(n), yj(n). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to modify the prior art teaching

of Boren with forming symbol indices as recited by the instant claims, because Boren suggests forming symbol indices later in fig. 1 and so it would be advantageous for it form it after a/d in 17 in order to be able to keep track of the data in the analogous art of data.

9. Boren does not teach transmitting the at least one complex symbol value from the plurality of transmitter antennas. Kawaguchi teaches transmitting the at least one complex symbol value from the plurality of transmitter antennas (Kawaguchi fig. 1: TX, I , Q, 10, 11).

10. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the transmitting the at least one complex symbol value from the one or more transmitter antennas to the first receiver antenna as recited by the instant claims, because the combined teaching of Boren with Kawaguchi suggest transmitting the at least one complex symbol value from the one or more transmitter antennas to the first receiver antenna as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Boren with Kawaguchi because Boren suggests communication (something broad) in general and Kawaguchi suggests the beneficial use of communication with transmitting a complex value from a plurality of transmit antennas such as QAM modulation (which uses I and Q) having a higher chance of being received (since they are from multiple sources) in the analogous art of communication.

11. The limitations in the preamble are not afforded patentable weight since these recitations occur in the preamble and recite the intended use of a structure and the body of the claim does not depend on the preamble for completeness and the bodily limitations are able to stand alone.

12. As per claim 4, Boren in view of Kawaguchi teaches the method of claim 1. Boren in view of Kawaguchi also teaches selecting a first receiver antenna of the plurality of receiver antennas as a function of a metric proportional to an average injection power corresponding to the first receiver antenna (Kawaguchi col. 3 lines 17-28).

13. As per claim 5: Boren in view of Kawaguchi teaches the method of claim 1. Boren does not teach selecting a first receiver antenna of the plurality of receiver antennas as a function of a vector norm corresponding to the first receiver antenna. Kawaguchi teaches selecting a first receiver antenna of the plurality of receiver antennas as a function of a vector norm corresponding to the first receiver antenna (Kawaguchi col. 3 lines 17-28).

14. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the selecting a first receiver antenna of the plurality of receiver antennas as a function of a vector norm corresponding to the first receiver antenna as recited by the instant claims, because the combined teaching of Boren with Kawaguchi suggest selecting a first receiver antenna of the plurality of receiver antennas as a function of a vector norm corresponding to the first receiver antenna as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Boren with Kawaguchi because Boren suggests communication (something broad) in general and Kawaguchi suggests the beneficial use of communication with selection of receive antenna as a function of strength and transmitting to the selected receive antenna such as transmitting to the strong receiver so that the receiver can receive it in the analogous art of communication.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu USPN 6,600,933 in view of Morris USPN 6,032,033. Here is how the references teach the claim:

16. As per claim 6, Hiramatsu teaches a plurality of transmitter antennas (Hiramatsu fig. 7, 8: antennas 1, 2; transmission); wherein the transmitting device can communicate using one or more propagation channels between said plurality of transmitter antennas and a plurality of receiver antennas (Hiramatsu figs. 7, 8, 16: propagation channel over free space; col. 1 line 5: radio; col. 1 line 26: channels) of a receiving device (Hiramatsu fig. 7, 8: antennas 1, 2, various elements; reception); and a transmitter operable to generate at least one complex symbol value (Hiramatsu fig. 10: 1001; fig. 11: 1101) in response to a reception of a binary stream assembled into groups of bits forming symbol indices (Hiramatsu fig. 14, 15: symbol; groups of bits for pilot, message, control, etc; these are groups of 0s and 1 or binary; fig. 10, 11: complex calculations based on reception; transmitter selects antenna in response to received magnitude), each complex symbol value of the at least one complex symbol value being normalized over one or more channel coefficients associated with said plurality of propagation channels (not in Hiramatsu but would be obvious as explained below).

17. Hiramatsu does not teach each complex symbol value of the at least one complex symbol value being normalized over one or more channel coefficients associated with said one or more propagation channels. Morris 6032033 teaches each complex symbol value of the at least one complex symbol value (Morris fig. 3: I, Q) being normalized over one or more channel coefficients associated with said one or more propagation channels (Morris fig. 3: slicer 230 has channel filter coefficients over which the noise is removed and the signal normalizes). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to

arrive at the each complex symbol value of the at least one complex symbol value being normalized over one or more channel coefficients associated with said one or more propagation channels as recited by the instant claims, because the combined teaching of Hiramatsu with Morris suggest each complex symbol value of the at least one complex symbol value being normalized over one or more channel coefficients associated with said one or more propagation channels as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Hiramatsu with Morris because Hiramatsu suggests complex data (Hiramatsu fig. 5) (something broad) in general and Morris suggests the beneficial use of filtering in the environment of complex data such as to remove noise in the analogous art of increasing signal quality.

18. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu in view of Morris as applied to claim 6 above, and further in view of Kawaguchi.

19. As per claim 9, Hiramatsu in view of Morris teach the transmitter device of claim 6. Hiramatsu in view of Morris does not teach wherein said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power of corresponding to said first receiver antenna; and said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna. Kawaguchi teaches wherein said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power of corresponding to said first receiver antenna (Kawaguchi col. 3 lines 17-28; Kawaguchi is a transceiver and accordingly it is a transmitter);

and said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna (Kawaguchi fig. 1: TX, I , Q, 10, 11).

20. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power of corresponding to said first receiver antenna; and said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims, because the combined teaching of Hiramatsu in view of Morris with Kawaguchi suggest said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power of corresponding to said first receiver antenna; and said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Hiramatsu in view of Morris with Kawaguchi because Hiramatsu in view of Morris suggests multiple antennas with transmission and reception (something broad) in general and Kawaguchi suggests the beneficial use of communication with selection of receive antenna as a function of power and transmitting to the selected receive antenna such as transmitting to the strong receiver so that the receiver can receive it in the analogous art of communication.

21. As per claim 10, Hiramatsu in view of Morris teach the transmitter device of claim 6. Hiramatsu in view of Morris does not teach a receiver operable to select a first receiver antenna

of said plurality of receiver antennas as a function of a metric proportional to an average injection power corresponding to said first receiver antenna, wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna. Kawaguchi teaches a receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power corresponding to said first receiver antenna (Kawaguchi col. 3 lines 17-28; Kawaguchi is a transceiver and accordingly it is a receiver), wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna (Kawaguchi fig. 1: TX, I , Q, 10, 11). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power corresponding to said first receiver antenna, wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims, because the combined teaching of Hiramatsu in view of Morris with Kawaguchi suggest receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a metric proportional to an average injection power corresponding to said first receiver antenna, wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Hiramatsu in view of Morris with Kawaguchi because Hiramatsu in view of Morris suggests multiple antennas with transmission and reception (something broad) in general and Kawaguchi suggests the beneficial use of communication with

selection of receive antenna as a function of power and transmitting to the selected receive antenna such as transmitting to the strong receiver so that the receiver can receive it in the analogous art of communication.

22. As per claim 11, Hiramatsu in view of Morris teach the transmitter device of claim 6. Hiramatsu in view of Morris does not teach wherein said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna; and said plurality of transmitter antennas are operable to transmit the at least one complex symbol value to said first receiver antenna. Kawaguchi teaches said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna (Kawaguchi col. 3 lines 17-28; amplitude is a vector norm since the amplitude is of the receive direction (vector) and one amplitude is being compared with the other amplitude or the norm; Kawaguchi is a transceiver and accordingly it is a receiver); and said plurality of transmitter antennas are operable to transmit the at least one complex symbol value to said first receiver antenna (Kawaguchi fig. 1: TX, I , Q, 10, 11). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the said transmitter is further operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna; and said plurality of transmitter antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims, because the combined teaching of Hiramatsu in view of Morris with Kawaguchi suggest said transmitter is further operable to select a first

receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna; and said plurality of transmitter antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Hiramatsu in view of Morris with Kawaguchi because Hiramatsu in view of Morris suggests multiple antennas with transmission and reception (something broad) in general and Kawaguchi suggests the beneficial use of communication with selection of receive antenna as a function of power and transmitting to the selected receive antenna such as transmitting to the strong receiver so that the receiver can receive it in the analogous art of communication.

23. As per claim 12, Hiramatsu in view of Morris teach the transmitter device of claim 6. Hiramatsu in view of Morris does not teach a receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna, wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna. Kawaguchi teaches a receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna (Kawaguchi col. 3 lines 17-28; amplitude is a vector norm since the amplitude is of the receive direction (vector) and one amplitude is being compared with the other amplitude or the norm; Kawaguchi is a transceiver and accordingly it is a receiver), wherein said plurality of transmitting antennas are operable to

transmit the at least one complex symbol value to said first receiver antenna (Kawaguchi fig. 1: TX, I , Q, 10, 11)

24. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the a receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna, wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims, because the combined teaching of Hiramatsu in view of Morris with Kawaguchi suggest a receiver operable to select a first receiver antenna of said plurality of receiver antennas as a function of a vector norm corresponding to said first receiver antenna, wherein said plurality of transmitting antennas are operable to transmit the at least one complex symbol value to said first receiver antenna as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Hiramatsu in view of Morris with Kawaguchi because Hiramatsu in view of Morris suggests multiple antennas with transmission and reception (something broad) in general and Kawaguchi suggests the beneficial use of communication with selection of receive antenna as a function of power and transmitting to the selected receive antenna such as transmitting to the strong receiver so that the receiver can receive it in the analogous art of communication.

25. Claims 13, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Morris and Affes USPN 6,975,666. Here is how the references teach the claims:

26. As per claim 13: computing a metric proportional to an average injection power for each receiver antenna of the plurality of receiver antennas (Kawaguchi col. 3 lines 17-28) of the receiving device (device of Kawaguchi) wherein the metric is based on measured complex channel coefficients associated with the one or more propagation channels (not in Kawaguchi but would be obvious as explained below); selecting a first antenna of the plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from the one or more transmitter antennas (Kawaguchi fig. 1: TX, I , Q, 10, 11; col. 3 lines 17-28; initial antenna selected could have small average injection power and thus when the system realizes this, it would switch antennas; if this is not sufficient, then it would be obvious for Kawaguchi to teach it as explained below).

27. If Kawaguchi does not teach said module further operable to select a first antenna of the plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from the plurality of transmitter antennas, then Morris 6032033 teaches said module further operable to select a first antenna of the plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from the plurality of transmitter antennas (Morris fig. 6; col. 1 line 62 to col. 2 line 3; one antenna is selected and it may receive a low or high signal level but it will always be compared with a second antenna selected to see which antenna to use.). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the said module further operable to select a first antenna of the plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from the plurality of transmitter antennas as recited by the instant claims,

because the combined teaching of Kawaguchi with Morris suggest said module further operable to select a first antenna of the plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from the plurality of transmitter antennas as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Kawaguchi with Morris because Kawaguchi suggests multiple antennas (something broad) in general and Morris suggests the beneficial use of selecting a low power antenna so that it can be compared with high power antenna so that a proper antenna choice can be made in the analogous art of communications. Kawaguchi does not teach wherein the metric is based on measured complex channel coefficients associated with the one or more propagation channels (not in Kawaguchi but would be obvious as explained below). Affes 6975666 teaches wherein the metric is based on measured complex channel coefficients (Affes 6975666 fig. 10: coefficients; col. 29 line 49; these are inherently calculated and hence measured; col. 21 line 61) associated with the one or more propagation channels (Affes 6975666 fig. 2 has various channels). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the metric is based on measured complex channel coefficients associated with the one or more propagation channels as recited by the instant claims, because the combined teaching of Kawaguchi with Affes suggest metric is based on measured complex channel coefficients associated with the one or more propagation channels as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Kawaguchi with Affes because Kawaguchi suggests reception strength calculation (something broad) in general and Affes suggests the beneficial use of reception strength

calculation based on complex channel coefficients associated with propagation channels such as to suppress interference in a CDMA system (Affes title) in the analogous art of communication.

28. As per claim 19: A transmitter device, comprising: a plurality of transmitter antennas (Kawaguchi fig. 1: 10, 11, TX) wherein the transmitting device can communicate using one or more propagation channels between said plurality of transmitter antennas and a plurality of receiver antennas (Kawaguchi fig. 1: free space between antennas; col. 1 lines 10-20 RF, mobile, wireless; fig. 1: 10, 11, RX) of a receiving device (Kawaguchi is a transceiver and accordingly it is a receiving device ; it has various elements for reception); and a module operable to compute a metric proportional to an average injection power for each receiver antenna of said plurality of receiver antennas (Kawaguchi col. 3 lines 17-26) of the receiving device (Kawaguchi is a transceiver and accordingly it is a receiving device; it has various elements for reception), wherein the metric is based on measured complex channel coefficients associated with the one or more propagation channels (not in Kawaguchi but would be obvious as explained below) and wherein said module is further operable to select a first antenna of said plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from said plurality of transmitter antennas (Kawaguchi fig. 1: TX, I , Q, 10, 11; col. 3 lines 17 28; initial antenna selected could have small average injection power and thus when the system realizes this, it would switch antennas; if this is not sufficient, then it would be obvious for Kawaguchi to teach it as explained below).

29. If Kawaguchi does not teach said module is further operable to select a first antenna of said plurality of receiver antennas of the receiving device having a smallest average injection

power to receive at least one complex value symbol from said plurality of transmitter antennas, then Morris 6032033 teaches said module is further operable to select a first antenna of said plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from said plurality of transmitter antennas (Morris fig. 6; col. 1 line 62 to col. 2 line 3; one antenna is selected and it may receive a low or high signal level but it will always be compared with a second antenna selected to see which antenna to use.)

30. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the said module is further operable to select a first antenna of said plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from said plurality of transmitter antennas as recited by the instant claims, because the combined teaching of Kawaguchi with Morris suggest said module is further operable to select a first antenna of said plurality of receiver antennas of the receiving device having a smallest average injection power to receive at least one complex value symbol from said plurality of transmitter antennas as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Kawaguchi with Morris because Kawaguchi suggests multiple antennas (something broad) in general and Morris suggests the beneficial use of selecting a low power antenna so that it can be compared with high power antenna so that a proper antenna choice can be made in the analogous art of communications.

31. Kawaguchi does not teach wherein the metric is based on measured complex channel coefficients associated with the one or more propagation channels. Affes 6975666 teaches

wherein the metric is based on measured complex channel coefficients (Affes 6975666 fig. 10: coefficients; col. 29 line 49; these are inherently calculated and hence measured; col. 21 line 61) associated with the one or more propagation channels (Affes 6975666 fig. 2 has various channels). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the metric is based on measured complex channel coefficients associated with the one or more propagation channels as recited by the instant claims, because the combined teaching of Kawaguchi with Affes suggest metric is based on measured complex channel coefficients associated with the one or more propagation channels as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Kawaguchi with Affes because Kawaguchi suggests reception strength calculation (something broad) in general and Affes suggests the beneficial use of reception strength calculation based on complex channel coefficients associated with propagation channels such as to suppress interference in a CDMA system (Affes title) in the analogous art of communication.

32. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Affes USPN 6,975,666. Here is how the references teach the claim:

33. As per claim 16, Kawaguchi teaches computing a vector norm for each receiver antenna of the plurality of receiver antennas (Kawaguchi col. 3 lines 17-28; amplitude is a vector norm since the amplitude is of the receive direction (vector) and one amplitude is being compared with the other amplitude or the norm) of the receiving device based on measured complex channel coefficients associated with the one or more propagation channels (not in Kawaguchi but would

be obvious as explained below); selecting a first antenna of the plurality of receiver antennas of the receiving device having a largest vector norm to receive at least one complex value symbol from the plurality of transmitter antennas (Kawaguchi fig. 1: TX, I , Q, 10, 11; col. 3 lines 17-28).

34. Kawaguchi does not teach wherein the metric is based on measured complex channel coefficients associated with the one or more propagation channels. Affes 6975666 teaches wherein the metric is based on measured complex channel coefficients (Affes 6975666 fig. 10: coefficients; col. 29 line 49; these are inherently calculated and hence measured; col. 21 line 61) associated with the one or more propagation channels (Affes 6975666 fig. 2 has various channels). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the metric is based on measured complex channel coefficients associated with the one or more propagation channels as recited by the instant claims, because the combined teaching of Kawaguchi with Affes suggest metric is based on measured complex channel coefficients associated with the one or more propagation channels as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Kawaguchi with Affes because Kawaguchi suggests reception strength calculation (something broad) in general and Affes suggests the beneficial use of reception strength calculation based on complex channel coefficients associated with propagation channels such as to suppress interference in a CDMA system (Affes title) in the analogous art of communication.

35. Claims 17, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Dehghan USPN 6,782,043. Here is how the references teach the claims:

36. As per claims 17 and 23, Kawaguchi does not teach the formula. Dehghan teaches the formula in col. 4 eq. 9 , col. 5 eq. 10, 11. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the formula as recited by the instant claims, because the combined teaching of Kawaguchi with Dehghan suggest the formula as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Kawaguchi with Dehghan because Kawaguchi suggests calculations (something broad) in general and Dehghan suggests the beneficial use of the formula such as to estimate as taught in Dehghan in the analogous art of calculations.

Claim Rejections - 35 USC § 102

37. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

38. Claim 22 is rejected under 35 U.S.C. 102(e) as being anticipated by Kawaguchi USPN 6,873,835. Here is how the reference teaches the claim:

39. As per claim 22, Kawaguchi teaches a transmitting device, comprising: a plurality of transmitter antennas (Kawaguchi fig. 1: 10, 11, TX) wherein the transmitting device can

communicate using one or more propagation channels between said plurality of transmitter antennas and a plurality of receiver antennas of a receiving device (Kawaguchi fig. 1: free space between antennas; col. 1 lines 10-20 RF, mobile, wireless; fig. 1: 10, 11, TX, RX); and a module operable to compute a vector norm for each receiver antenna of said plurality of receiver antennas of the receiving device (Kawaguchi col. 3 lines 17-28; amplitude is a vector norm since the amplitude is of the receive direction (vector) and one amplitude is being compared with the other amplitude or the norm), said module further operable to select a first antenna of said plurality of receiver antennas having a largest vector norm to receive at least one complex value symbol from said plurality of transmitter antennas (Kawaguchi fig. 1: TX, I , Q, 10, 11; col. 3 lines 17-28).

Allowable Subject Matter

40. Claims 2, 3, 7, 8, 14, 15, 18, 20, 21, 24 are allowed. See prior action for details.

Conclusion

41. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

42. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

43. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Thurs and Fri after 8AM to after 6:30PM.

44. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

45. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pankaj Kumar
Patent Examiner
Art Unit 2631

PK